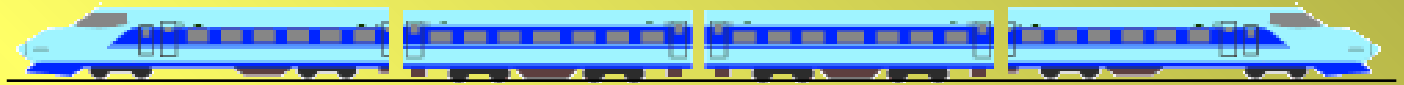
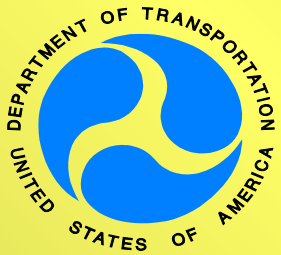


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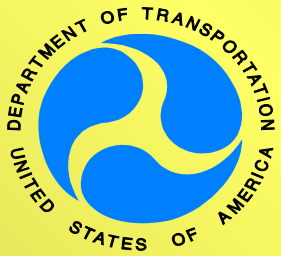


Nationwide Differential Global Positioning System (NDGPS)

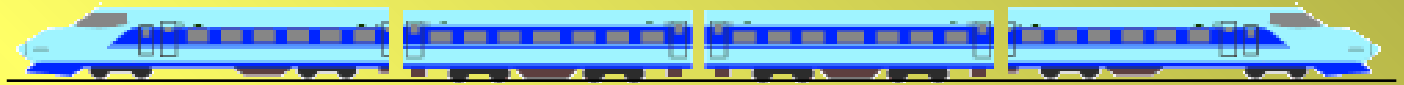
**Richard Fontana
U.S. Department of
Transportation**

**Presented at GPS Industry Days, May
9, 2000**

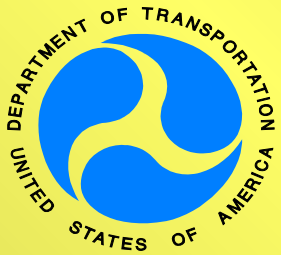
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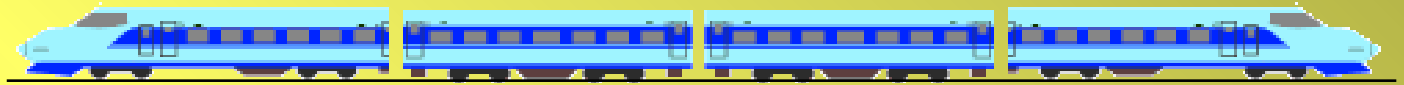
Topics



- **Introduction**
- **Surface Transportation**
- **Railroad Requirement**
- **Coverage Today and This Year**



Introduction

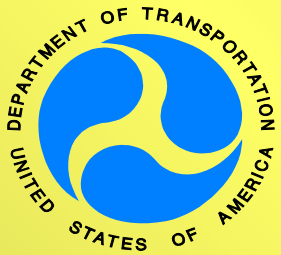


- **Background**

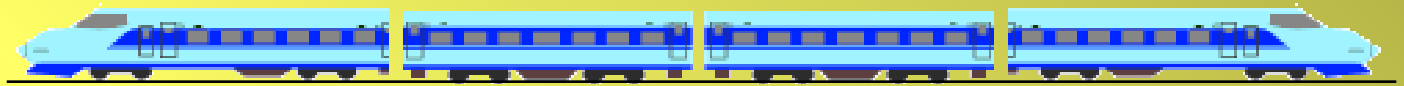
- Coast Guard -- Maritime DGPS Service
- 1994 Study -- Expand CG System for Land Users
- Coast Guard Service Fully Operational March 15, 1999

- **Description**

- GPS Augmentation for Surface Transportation
 - Differential GPS Technique
 - Land & Maritime Users
- Improved Accuracy & Integrity
- Complements Aviation Augmentations



Surface Transportation



- **Characteristics**

- Designed for Surface Transportation
- Advantages of LF/MF for Surface Use
 - Less affected by surroundings
 - Frequency band is protected

- **Transportation & State Benefits**

- Intelligent Transportation Systems (ITS)
- Maritime Transportation System (MTS)
- Asset Management, Weather Forecasting, Emergency Response, Surveying, Mapping, etc.

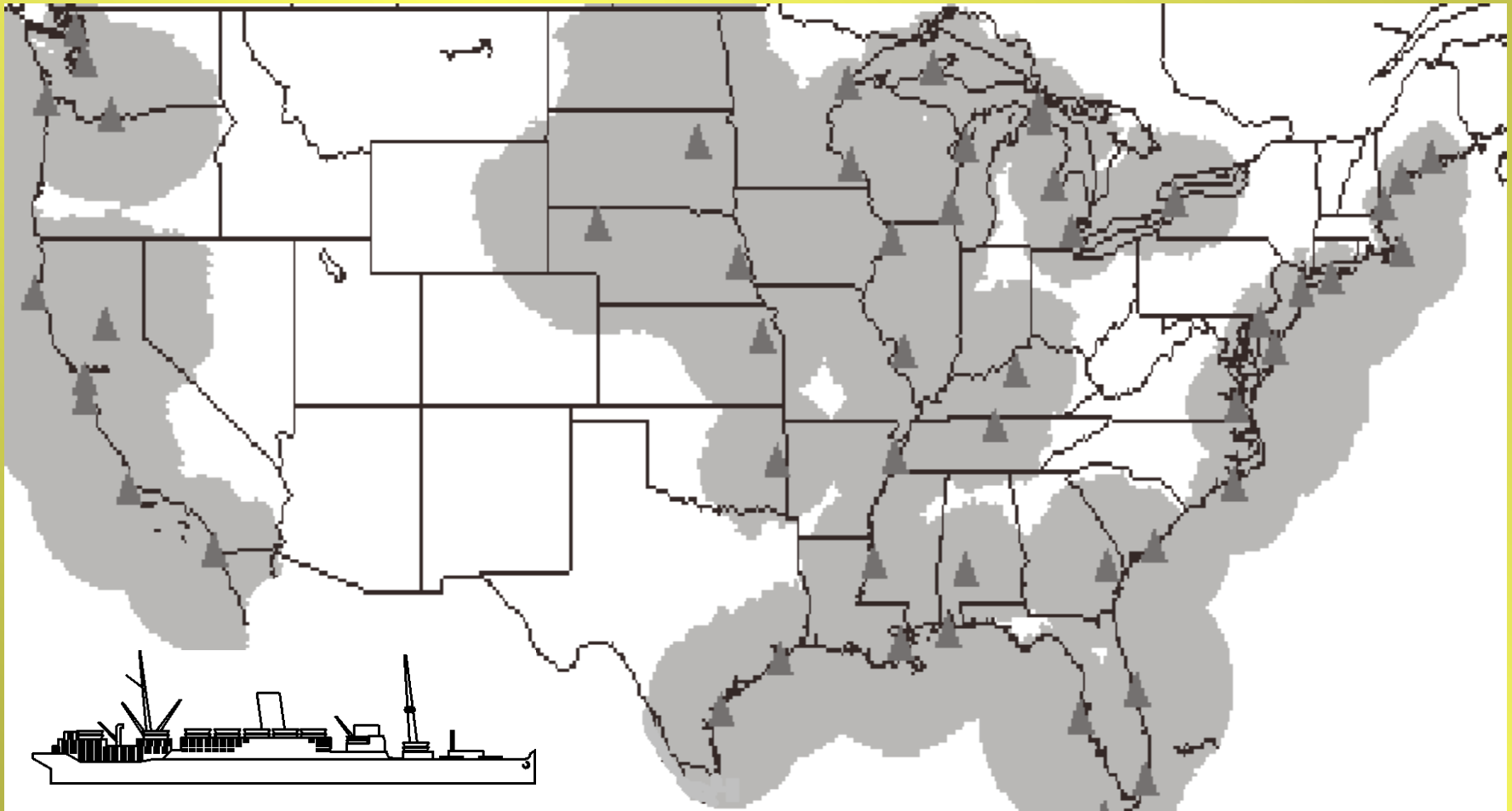
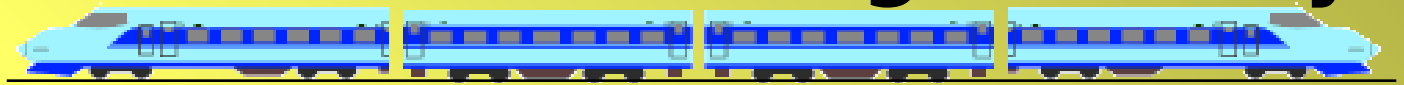
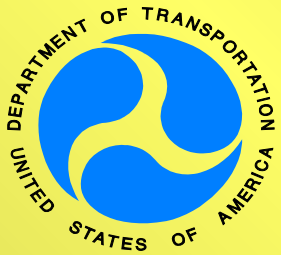


- **Federal Requirement**

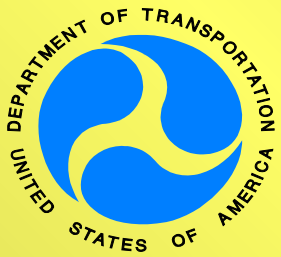
- Location Determination System for Positive Train Control (PTC)
- PTC a NTSB "Most Wanted" Safety Initiative
- Double Coverage for Increased Availability to Railroads

Unclassified

NDGPS Coverage - Today

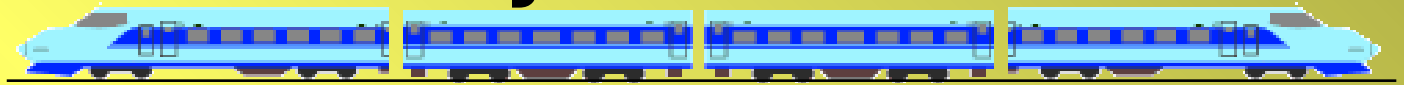


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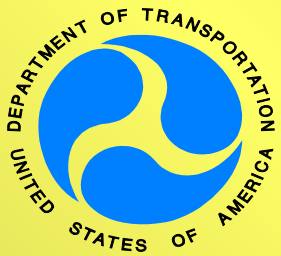


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Major Railroad Lines

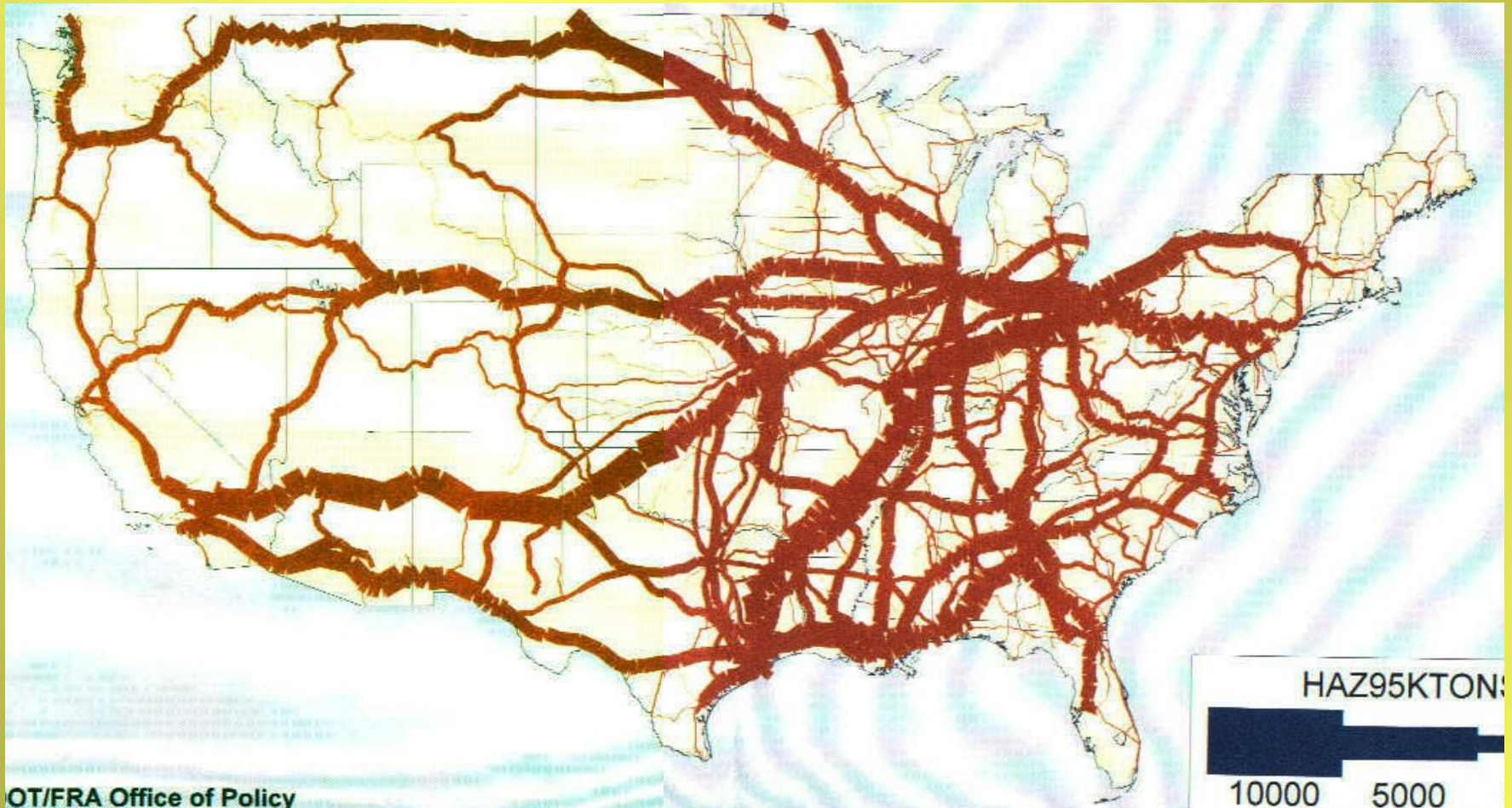
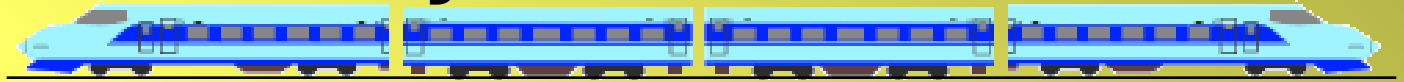


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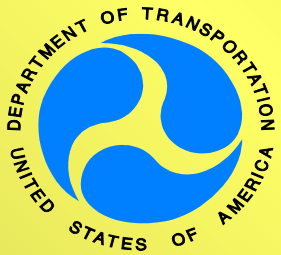
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Major HAZMAT Routes

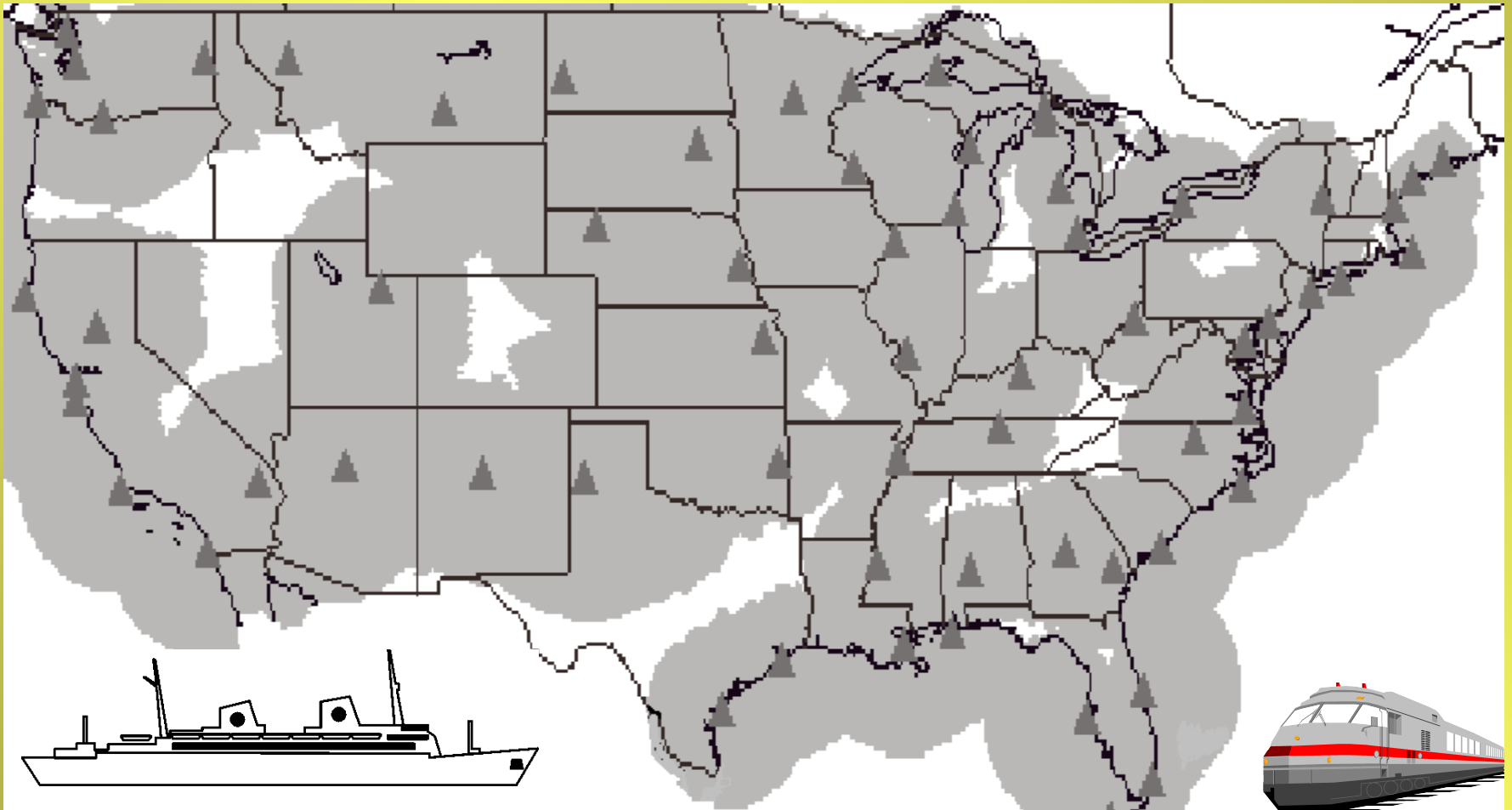


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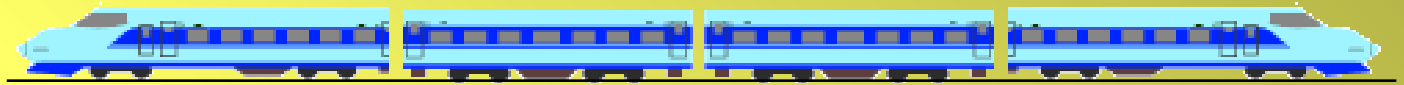
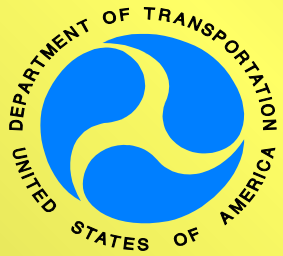


CONUS Coverage - Dec 2000



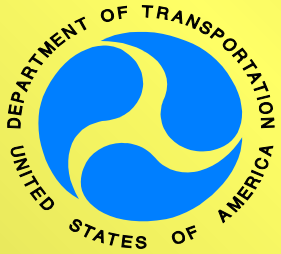
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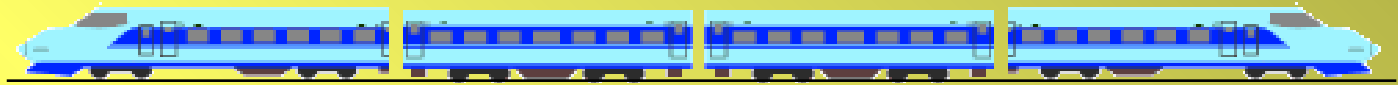


QUESTIONS?

Unclassified



Backup Slide -- Resources



- **\$37 M Implements Double Coverage (for Rail)**
- **\$7 M Annual Ops & Maintenance**
- **FY 2000 -- \$5.0 million Appropriated (includes O&M)**
 - 20 "land sites" (total) added to Coast Guard Maritime Service
 - Focus: Bridge mid-Continent coverage gap to allow PTC demos
- **FY 2001 -- \$18.7 million Requested**
 - 45 land sites -- Single covers the Continental U.S. (CONUS)
 - Double covers the transportation corridor in Alaska
 - Begins double CONUS coverage for railroad requirement
- **Contributions from non-DOT Agencies**